

We claim:

sub A7 1. A computer-implemented method comprising:

at a sender, in a sender transaction:

receiving a message from a sender queue;

5 generating a substantially unique identifier and an expiration time for the message;

saving the identifier, the expiration time, and the message in a sender database;

sending the identifier, the expiration time, and the message from the sender to a receiver;

10 at the receiver, in a receiver transaction:

receiving the identifier, the expiration time, and the message from a receiver queue;

determining whether the message has expired based on the expiration time for the message;

15 upon determining that the message has not expired:

determining whether the message is present in a receiver database, by the identifier therefore;

upon determining that the message is not present in the receiver database:

saving the identifier, the expiration time, and the message in the

20 receiver database; and,

performing actions associated with the message.

sub A17

2. The method of claim 1, further comprising, at the receiver, in the receiver transaction:

otherwise, upon determining that the message is present in the receiver database, discarding the message; and,

5 otherwise, upon determining that the message has expired, discarding the message.

3. The method of claim 1, further comprising sending an acknowledgment message from the receiver to the sender that corresponds to the message.

4. The method of claim 3, further comprising, at the sender, in a second sender transaction:

10 receiving the acknowledgment message; and,

deleting the message in the sender database that corresponds to the acknowledgment message, including the identifier and the expiration time for the message.

5. The method of claim 1, further comprising, at the sender, deleting the message from the sender database when the expiration time has been reached.

15 6. The method of claim 5, wherein deleting the message from the sender database comprises deleting the message by a scavenger thread of the sender.

7. The method of claim 1, further comprising, at the receiver, deleting the message from the receiver database when the expiration time has been reached.

Sub A7 8. The method of claim 7, wherein deleting the message from the receiver database comprises deleting the message by a scavenger thread of the receiver.

9. The method of claim 1, wherein the message comprises an express, non-transactional message.

5 10. A machine-readable medium having instructions stored thereon for execution by a processor of a sender to perform a method at the sender for guaranteed exactly-once delivery of an express, non-transactional message from the sender to a receiver, comprising:

in a sender transaction:

10 receiving the message from a sender queue;

generating a substantially unique identifier and an expiration time for the message;

saving the identifier, the expiration time, and the message in a sender database;

and,

15 sending the identifier, the expiration time, and the message to the receiver.

11. The medium of claim 10, the method further comprising deleting the message from the sender database when the expiration time has been reached.

12. The medium of claim 10, the method further comprising, in a second sender transaction:

20 receiving an acknowledgment message corresponding to the message; and,

Sub A7 7

deleting the message in the sender database, including the identifier and the expiration time for the message.

13. A machine-readable medium having instructions stored thereon for execution by a processor of a receiver to perform a method at the receiver for guaranteed exactly-once delivery of an express, non-transactional message from a sender to the receiver, comprising:

5 in a receiver transaction:

receiving the identifier, the expiration time, and the message from a receiver queue;

10 determining whether the message has expired based on the expiration time for the message;

upon determining that the message has not expired:

determining whether the message is present in a receiver database, by the identifier therefor;

15 upon determining that the message is not present in the receiver database:

saving the identifier, the expiration time, and the message in the receiver database; and,

performing actions associated with the message.

14. The medium of claim 13, the method further comprising deleting the message from the database when the expiration time has been reached.

20

003220-094450

Sub A77

15. The medium of claim 13, the method further comprising, in the receiver transaction:

otherwise, upon determining that the message is present in the receiver database, discarding the message; and,

5 otherwise, upon determining that the message has expired, discarding the message.

16. The medium of claim 13, the method further comprising sending an acknowledgment message to the sender that corresponds to the message.

17. A computerized system for guaranteed, exactly once delivery of an express, non-transactional message comprising:

10 a sender comprising:

a first queue;

a first database;

a first computer program designed to, in a sender transaction, receive the message from the first queue, generate a substantially unique identifier and an expiration time for the message, and save the identifier, the expiration time, and the message in the first database; the program further designed to send the identifier, the expiration time, and the message;

a receiver comprising:

a second queue;

20 a second database;

a second computer program designed to, in a receiver transaction, receive the identifier, the expiration time, and the message from the second queue as received

008220"0944560

Sub A77
thereby from the sender, determine whether the message has expired based on the expiration time for the message, determine whether the message is present in the second database by the identifier therefor, and upon determining that the message has not expired and is not present in the second database, save the identifier, the expiration time, and the message in the second database, and perform actions associated with the message.

18. The system of claim 17, wherein the sender further comprises a computer-readable medium and a processor, such that the first computer program is executed by the processor from the medium.

19. The system of claim 17, wherein the receiver further comprises a computer-readable medium and a processor, such that the second computer program is executed by the processor from the medium.

20. A sender computer of a computerized system also including a receiver, the system for guaranteed exactly-once delivery of an express, non-transactional message from the sender to the receiver, the sender comprising:

a queue;
a database; and,
means for
in a sender transaction,
receiving the message from the queue;
generating a substantially unique identifier and an expiration time
for the message;

Sub A⁷ 7

saving the identifier, the expiration time, and the message in the
database, and,

sending the identifier, the expiration time, and the message to the receiver.

21. A receiver computer of a computerized system also including a sender, the system for
5 guaranteed exactly-once delivery of an express, non-transactional message from the
sender to the receiver, the receiver comprising:

a queue;

a database; and,

means for, in a receiver transaction,

10 receiving the identifier, the expiration time, and the message from the queue as
received thereby from the sender;

determining whether the message has expired based on the expiration time for the
message;

determining whether the message is present in the database by the identifier
15 therefor; and,

upon determining that the message has not expired and is not present in the
database, saving the identifier, the expiration time, and the message in the database, and
performing actions associated with the message.

Add A² 7